

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-019808**Date Inspected:** 28-Jan-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1500**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

- A). Field Splice W1/W2
- B). DAH Access Hole/PP10.5
- C). DAH Access Hole/PP19.5
- D). Field Splice W2/W3
- E). QC Inspection Request

A). Field Splice W1/W2

The QAI observed the Visual Weld Inspection (VT) performed by the QC inspector John Pagliero of the "A" deck longitudinal stiffener located at the W1/W2 field splice identified as WN: 1W-2W-A-LS1, LS2 and LS3 and no rejectable discontinuities were noted by Mr. Pagliero.

At the conclusion of the VT, Mr. Pagliero performed the Magnetic Particle Testing (MPT) of the Complete Joint Penetration (CJP) groove welds utilizing a Parker Contour Probe identified as a DA-400 as per the MPT procedure identified as SE-MT-D1.5-CT-100 Rev.4. No rejectable indications were noted and Mr. Pagliero commence the Ultrasonic Testing (UT) of the CJP groove welds of the stiffener field splices as identified in the previous paragraph. The testing was performed utilizing a G.E./Krautkramer USM 35X and the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4 and the applicable contract documents. The QC technician performed the required

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longitudinal wave technique, utilizing a 25.4mm diameter transducer, to perform the examination for base metal soundness and the shear wave technique for the examination of weld soundness which was performed utilizing a 16mm x 19mm rectangular transducer. At the conclusion of the welding no rejectable indications were noted by the QC technician.

### B). Deck Access Hole/PP10.5

The QAI observed the welder Jin Pei Wang ID-7299 perform the repair welding of the area marked as UT reject on the Complete Joint Penetration (CJP) groove weld identified as WN: 1W-10.5-W2-NW, R2 cycle repair. Also at the conclusion of the excavation the QC technician Steve McConnell performed a Magnetic Particle Test (MPT) of the excavated area and no rejectable indications were noted. The application and evaluation of the MPT appeared to comply with the MPT procedure identified as SE-MT-CT-D1.5-101 Rev. 4. The repair welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process and the 3.2mm electrode as per the Welding Procedure Specification (WPS) identified as ABF-WPS-1001 Repair Rev. 0. The WPS was also used by the QC inspector, Mr. McConnell, as a reference to monitor and verify the Direct Current welding parameters which were noted as 135 amps. The welding was performed in the flat position (1G) with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The dimensions of the excavation were noted and recorded as follows; ,Y=2390, L=80 mm, d=15 mm.

### C). Deck Access Hole/ PP19.5

The QAI observed the repair welding of the deck access hole identified as WN: 3W-PP19.5-W5-SW, repair cycle # R1. The repair welding was performed by the welder Kitlai Wai ID-2953 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Weld Procedure Specification (WPS) ABF-WPS-D15-1001 Repair, Rev. 0. The WPS was also utilized by the QC inspector, Steve McConnell to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 131 amps and the minimum preheat temperature of 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welding was performed in the flat (1G) position utilizing a 3.2 mm low hydrogen electrode.

Prior to the repair welding, the QC inspector performed a Magnetic Particle Test (MPT) of the excavations, which were ground to a bright metal. The testing was performed utilizing the procedure identified as SE-MT-D1.5-CT-100 Rev.4. At the conclusion of the VT and MPT, the welder commenced the welding of the repairs and the dimensions are noted as follows; Y=380 mm, L=90 mm, d=17 mm and Y=545 mm, L=120 mm and d=17.5 mm.

### D). Field Splice W2/W3

The QAI observed the welder, Hua Qiang Hwang ID-2930, performed fit-up and the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2W-3W-A-LS-4. The fit-up and alignment appeared to comply with the contract specifications and the welder proceeded with the welding operation utilizing the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector Gary Erhsam as a reference. The amperage was recorded as 126 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

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The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from the sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI.

### E). QC Inspection Request

At the request of Quality Control Field Supervisor, Bonifacio Daquinag, the QAI randomly verified the QC visual inspection of the Complete Joint Penetration (CJP) welding of the following; WN: 1W-2W-A-LS1 through LS3. The QAI verification was performed to verify that the welding and the visual weld inspection performed by the QC inspector meet the requirements of the contract documents. At the conclusion of the QAI verification it appeared that the welds and the QC inspection complies with the contract documents.

At the conclusion of the VT verification, the QAI performed a random ultrasonic and a magnetic particle verification test of the Complete Joint Penetration (CJP) groove welds mentioned above. A total area of approximately 10% was ultrasonically tested to verify the weld and testing by QC meet the requirements of the contract documents. The examination was performed and completed on this date. An ultrasonic test report TL-6027 and TL-6028, was generated on this date.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspectors utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW welding process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The digital photographs on page 4 of this report illustrate some of the work observed during this scheduled shift.

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## Summary of Conversations:

There were general conversations with Quality Control Inspector Bonifacio Daquinag, Jr. at the start of the shift regarding the location of American Bridge/Fluor welding, inspection and N.D.E. testing personnel scheduled for this shift.

## Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

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**Inspected By:** Reyes, Danny

Quality Assurance Inspector

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**Reviewed By:** Levell, Bill

QA Reviewer